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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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GROUP 1700

Application Number: 10/660,990
Filing Date: September 12, 2003
Appellant(s): HOTTOVY ET AL.

Michael G. Fletcher
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 31, 2006 appealing from the Office action mailed January 19, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,239,235	Hottovy et al.	5-2001
6,833,415	Kendrick et al.	12-2004

6,806,324	Hottovy et al.	10-2004
6,743,869	Franklin, III et al.	06-2004
6,815,511	Verser et al.	11-2004
2002/0173598	Kendrick et al.	11-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Double Patenting

Claims 1-4, 6, 7, 9-15, and 21-27 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over (i) claims 1-25 of U.S. Patent No. 6,239,235, (ii) claims 1-19 of U.S. Patent No. 6,806,324, (iii) claims 1-9 of U.S. Patent No. 6,743,869, and (iv) claims 1-13 of U.S. Patent No. 6,815,511. Although the conflicting claims are not identical, they are not patentably distinct from each other because the subject matter of the instant claims is the obvious variations of claims of the cited US patents, see the following rejection under 35 U.S.C. 102(b) for detailed analysis.

Claim Rejections - 35 USC § 112

Claims 5 and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 5 and 8

The base of the percentage of the monomer is not defined.

Claim Rejections - 35 USC § 102

A. Claims 1-4, 6, 7, 9-15, and 21-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Hottovy et al. (US 6,239,235).

Hottovy teaches an olefin slurry polymerization process conducted in a loop reactor with continuous product slurry take off wherein the monomer is introduced at plurality of locations to the loop reactor, the slurry polymer product is removed from the loop reactor at a plurality of continuous take off appendages (col. 4, lines 8-12; col. 5, lines 41-42; col. 6, lines, 2-26 and 44-54; col. 7, lines 21-67; and claims 1-10).

The instant claims recite the same basic steps as Hottovy's polymerization process. It is noted that Hottovy does not expressively disclose a few minor details of the instant claims, however, those details are possessed by Hottovy's polymerization process. For example, Claims 1 and 24 require multiple monomer feeds being symmetrically arranged around the reactor; Claim 6 requires at least one monomer feed per 800 feet of reactor length; Claim 7 requires at least one monomer feed per 18,000 gallons of reactor volume; Claim 9 states that measuring the concentration of the olefin monomer in the withdrawn portion of the fluid slurry, and adjusting the introduction of the olefin monomer in response to the measured concentration; Claim 10, which depends from Claim 9, further states wherein the introduction of the olefin monomer is adjusted so that a different amount of the olefin monomer is fed at one monomer feed than the amount of the olefin monomer fed at another monomer feed; Claim 14 recites

wherein each of the monomer feeds is separately controlled; and Claim 15 requires the molecular weight distribution of the polyolefin product to be unimodal.

Hottovy discloses monomers are introduced to the reactor directly at one or a plurality of locations (col. 4, lines 7-11). Because appellants do not disclose the type of symmetry of the arrangement of the monomer feeds, all arrangements of the monomer feeds of the reactor have some sort of symmetry. For example, the simplest multiple monomer feeds is two monomer feeds in Hottovy's loop reactor and the two feeds would have a symmetric plane if they are on the same level of the loop and a C_2 symmetry if they are not on the same level of the loop. Hottovy's Examples show continuous polymerizations conducted with a four vertical leg polymerization reactor with reactor length of 941 ft and Reactor volume of 18700 gals for period of 6, 5, and 4 days with ethylene concentration controlled at 4.43, 3.67 and 4.9 wt% respectively, hexene concentration controlled at 0.22, 0.17 and 0.14 wt% respectively, and polymer production rate of 40.1, 40.7 and 39.9 mlbs/hr respectively. In order to achieve constant ethylene and hexene concentration throughout the 941 ft long reactor for period of days period of time, the the concentration of the olefin monomer in the withdrawn portion of the fluid slurry must be measured, and the introduction of the olefin monomer must be adjusted in response to the measured concentration in order to keep the olefin monomer concentration constant throughout the long loop reactor. There must be multiple feeds for monomers and catalyst around the rather long loop reactor at the regular intervals to compensate the monomer being consumed for the formation of the olefin polymer product and the catalyst unavoidably deactivated in the polymerization

media. Since the multiple feeds for monomers and catalyst are around reactor length of 941 ft and reactor volume of 18700 gal, there must be at least one monomer feed per 800 feet of reactor length and per 18,000 gallons of reactor volume. Because the olefin polymerization in the presence of chromium oxide catalyst fluctuates at times, each monomer feed must be separately controlled for Hottovy's large capacity reactor in order to keep the monomer concentration and polymer production rate at constant. Since Hottovy's ethylene-hexene polymerization of the working examples are conducted in the presence of a single chromium oxide catalyst under constant polymerization conditions without any molecular weight controlling agent, i.e., monomer concentrations, catalyst concentration, polymerization temperature, polymerization time and polymerization rate are constant, only monomoldal molecular weight distribution ethylene-hexene copolymer would be produced.

In view the foregoing, Hottovy's teaching encompasses the instant claims.

B. Claims 1-15 and 21-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Kendrick et al. (US 2002/0173598 A1, now US Pat. No. 6,833,415, the application publication is cited in the rejection).

In claims 161 and 162 of page 17, Kendrick claims a polymerization process in a loop reactor comprising feeding the catalyst into the reactor from multiple inlets, feeding monomer, comonomer, diluent and other additives to the reactor through multiple feed inlets, and discharging the polymer slurry intermediate product through at least two discharge conduits; wherein the feed inlets are symmetrically arrange around the reactor and the reaction kinetics are maintain constant. The multiple feed inlets and

multiple discharge conduits are demonstrated in Figs. 5 and 6 with explanations in paragraphs [0064] and [0065] on page 6, and paragraphs [0071] on page 7. Kendrick teaches that the discharging slurry intermediate product has a higher weight percentage of polymer solids than the weight percentage of solids in the circulating slurry in the reactor (paragraphs [0026] and [0027]), the difference of the reactant monomer concentrations, measured in wt.%, taken at any two points along the loop reactor is within 20% of the higher value (paragraph [0063]). The range of ethylene concentration variation of Kendrick's Example 3 and 4 are 0.4 and 1.0 wt.% respectively.

Kendrick's teaching anticipates the instant claims and Kendrick's claims are substantially identical or obvious variations of the instant claims.

(10) Response to Argument

Response over the arguments over the First to Fourth Ground of Rejections

Appellants are reminding the Board, "the Examiner may not rely on the specification of the patent underlying the double patenting rejection as prior art in the obviousness determination". However, according MPEP §804, under obviousness-type double patenting, to decide an obvious variation of a claim, one is not precluded from all use of the patent disclosure, and the "portion of the specification supports the patent claims and may be considered." *In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619,622 (CCPA 1970). The instant claims recite the same basic steps as the claims of the cited patent except few minor details such as the monomer feeds being symmetrically arranged around the reactor. While it is the fact that Hottovy '235 claims recite polymerization at least one monomer in loop reaction zone and are not explicitly

including the limitations about how the monomer is fed to the loop reaction zone, however, feeding monomer to the loop reaction zone is a required step for conducting polymerization in the loop reactor. Therefore, the portion of specification describing the monomer feeding supports the patent claims and may be considered. Hottovy '235 discloses monomers are introduced to the reactor directly at one or a plurality of locations, see col. 4, lines 7-11. Because appellants do not disclose the type of symmetry of the arrangement of the monomer feeds, all arrangement of the monomer feeds of the reactor have some sort of symmetry. For example, the simplest multiple monomer feeds is two monomer feeds in the loop reactor of Hottovy '235 and the two feeds would have a symmetric plane if they are on the same level of the loop and a C_2 symmetry if they are not on the same level of the loop.

In view the foregoing, the obviousness-type double patenting rejections over Hottovy '235 claims are still deemed to be proper and thus maintained.

For the same token, the obviousness-type double patenting rejections over (ii) claims 1-19 of U.S. Patent No. 6,806,324, (iii) claims 1-9 of U.S. Patent No. 6,743,869, and (iv) claims 1-13 of U.S. Patent No. 6,815,511 are also maintained since the cited patents all share the same specification of Hottovy '235.

Response over the arguments over the Fifth Ground of Rejections

Claims 5 and 8 are rejected because the base of the percentage of the monomer is not defined. Appellants cite Examples I and II of the specification to support their position that "the monomer concentration is expressed as a weight percent of the liquid contents in the reactor". While Examples I and II provide support for the unit of the

monomer concentration, Examples I and II also show that the monomer concentration in the loop reaction ranging from 3.32 to 4.93 wt% which is much higher than the 1.05% and 0.4% of claims 5 and 8 respectively. It appears that the ranges of monomer concentrations of 1.05% and 0.4% of claims 5 and 8 respectively represent the variation ranges of monomer concentrations in the loop reactor; however, this is not reflected in the claims. Therefore, claims 5 and 8 as written is not enabled because the range of concentrations of 1.05% or smaller and 0.4% or smaller are too small to practically conduct olefin polymerization in the loop reactor in industry.

Appellants further assert that claim 5 expresses the swing in monomer concentration as an absolute difference in percentage in the loop reaction zone and assert that such expression is a well-known methodology in the art. However, appellants' own disclosure as shown in Examples I and II is contradictory to such assertion wherein the swing or range of ethylene concentration for Example I is from 4.27 wt% to 4.93 wt% and for Example II is from 3.32 wt% to 4.68 wt%. The terminology for monomer concentration of claims 5 and 8 is inconsistent with that of the specification.

If the limitation of the range of monomer (ethylene) concentration is intended to mean the range variation of monomer concentration, appropriate amendments to the claims are requested and the same amendment to the descriptions of lines 8-9 of paragraph of [0008] and line 7 of [0020] of the specification are also requested.

Response over the arguments over the Sixth Ground of Rejections

Appellants argue, "Hottovy '235 is absolutely devoid of arranging monomer feeds and/or product take-offs substantially symmetrically around the loop reactor. Therefore, Hottovy '235 cannot anticipate claims 1 and 24, or their dependent claims." Appellants state, "claim 2 recites wherein the catalyst is fed to the loop reaction zone through a plurality of catalyst feeds." and "Claim 6 recites wherein the plurality of monomer feeds comprises at least one monomer feed per 800 feet of reactor length. Claim 7 recites wherein the plurality of monomer feeds comprises at least one monomer feed per 18,000 gallons of reactor volume. Hottovy '235 is absolutely devoid of these features." and "Claim 9 states that measuring the concentration of the olefin monomer in the withdrawn portion (e.g., in conduit 36) of the fluid slurry, and adjusting the introduction of the olefin monomer (e.g., via control valve 32) in response to the measured concentration. Claim 10, which depends from claim 9, further states wherein the introduction of the olefin monomer is adjusted (e.g., via control valve 32) so that a different amount of the olefin monomer is fed at one monomer feed than the amount of the olefin monomer fed at another monomer feed. See id. Claim 14 recites wherein each of the monomer feeds (e.g., control valves 32) is separately controlled. See id. In contrast, Hottovy '235 merely mentions that the monomer is introduced to the reactor. Hottovy '235 plainly does not address the control scheme of the monomer feed, in general, much less the specific features recites in claims 9, 10, and 14." and "[l]astly, claim 15 recites wherein the solid polyolefin particles (e.g., polyethylene, polypropylene,

etc.) have a molecular weight distribution that is unimodal. See Application, ¶ 23. Hottovy '235 is absolutely devoid of such a feature."

The examiner disagrees. First of all, as discussed previously, Hottovy discloses monomers are introduced to the reactor directly at one or a plurality of locations, see col. 4, lines 7-11. Because applicants did not disclose the type of symmetry of the arrangement of the monomer feeds, all arrangement of the monomer feeds of the reactor have some sort of symmetry. For example, the simplest multiple monomer feeds is two monomer feeds in the loop reactor of Hottovy and the two feeds would have a symmetric plane if they are on the same level of the loop and a C_2 symmetry if they are not on the same level of the loop. In fact, it is not possible for a loop reactor with two feeds to be non-symmetrical, all configurations have C2 symmetry or mirror plane. Secondly, Hottovy discloses continuous take of mechanism 34 is located in or adjacent to a downstream end of the lower horizontal reactor loop sections 16 and adjacent or on a connecting elbow and the continuous take off appendage can be located on any segment or any elbow, and Hottovy emphasizes the location can be in a area near the last point in the loop where flow turn upward before the catalyst introduction point so as to allow fresh catalyst the maximum possible time in the reactor before it first passes a take off point (col. 4, lines 15-26 and col. 5, lines 31-48). Hottovy's Fig. 1 shows four symmetrical segments 16, one would immediately anticipate four symmetrical continuous take off appendages in the loop reactor. In order to keep the monomer concentration and catalyst concentration to be same throughout the whole loop reactor, thus constant polyolefin take off rate, one would anticipate four monomer

and catalyst feeds respectively to be similarly symmetrically arranged relative to the four take off appendages around the loop reactor. Thirdly, as stated in the grounds of rejection, Hottovy's Examples (Data Table of col. 7) show continuous polymerizations conducted with a four vertical leg polymerization reactor with reactor length of 941 ft and Reactor volume of 18700 gal for period of 6, 5, and 4 days with ethylene concentration controlled at 4.43, 3.67 and 4.9 wt% respectively, hexene concentration controlled at 0.22, 0.17 and 0.14 wt% respectively, and polymer production rate of 40.1, 40.7 and 39.9 mlbs/hr respectively. In order to achieve constant ethylene and hexene concentration throughout the 941 ft for period of days period of time, the the concentration of the olefin monomer in the withdrawn portion of the fluid slurry must be measured, and the introduction of the olefin monomer must be adjusted in response to the measured concentration in order to keep the olefin monomer concentration constant throughout the long loop reactor. There must be multiple feeds for monomers and catalyst around the rather long loop reactor at the regular intervals to compensate the monomer being consumed for the formation of the olefin polymer product and the catalyst unavoidably deactivated in the polymerization media. Since the multiple feeds for monomers and catalyst are around reactor length of 941 ft and reactor volume of 18700 gal, there must be at least one monomer feed per 800 feet of reactor length and per 18,000 gallons of reactor volume. Because the olefin polymerization in the presence of chromium oxide catalyst fluctuates at time, the each monomer feed must be separately controlled for Hottovy's large capacity reactor in order to keep the monomer concentration and polymer production rate at constant. Lastly, as shown

above, Hottovy's ethylene-hexene polymerization of the working examples are conducted in the presence of a single chromium oxide catalyst under constant polymerization conditions, i.e., monomer concentrations, catalyst concentration, polymerization temperature, polymerization time and polymerization rate are constant, only monomoldal molecular weight distribution ethylene-hexene copolymer would be produced.

In view the foregoing, the rejections are deemed proper and thus maintained.

Response over Appellants' Request for Evidence to Support Official Notice

Since the examiner has shown that the features of the appealed claims are possessed by Hottovy's polymerization process, there is no need for any Official Notice.

Response over Seventh Ground of Rejection-35 USC 102(e) and Appellants' Request of Removal of Kendrick

The Kendrick reference is U.S. patent and U.S. patent application publication of a patented application that claims the rejected invention. Applicant's declaration of June 27, 2005 under 37 CFR 1.131(a) is insufficient for showing priority to Kendrick reference because the reference is claiming the same patentable invention, see MPEP § 2305, Requiring a Priority Showing. If the reference and this application are not commonly owned, the reference can only be overcome by establishing priority of invention through interference proceedings. However, the instant claims are not free of rejections rather than the rejections over Kendrick reference, an interfere can not provoked at this time.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Caixia Lu

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